

CLAIMS

1. A method of determining which, if any, communication protocols can be used to extract status information related to a network device, comprising:

selecting a communication protocol among a plurality of communication protocols;
obtaining, from a device object associated with the network device, information for accessing the network device using the selected communication protocol;

determining if the network device can be accessed using the selected communication protocol and the information for accessing the network device obtained from the device object;

if the determining step determines that the network device can not be accessed using the selected communication protocol, removing, from the device object, the information for accessing the network device using the selected communication protocol; and

if the determining step determines that the network device can be accessed using the selected communication protocol, performing further tests to determine whether the selected communication protocol can be used to extract the status information from the network device.

2. The method of claim 1, wherein the step of performing further tests comprises:

determining whether a vendor of the network device can be obtained from the network device using the selected communication protocol;

if the preceding determining step determines that the vendor can not be obtained using the selected communication protocol, checking whether the selected communication protocol supports a generic vendor, and if the selected communication protocol does not support the generic vendor, removing, from the device object, the information for accessing the network device using the selected communication protocol;

if the preceding determining step determines that the vendor can be obtained using the selected communication protocol, obtaining the vendor from the network device and determining whether the obtained vendor is supported by the selected communication protocol;

if the obtained vendor is not supported by the selected communication protocol, checking whether the selected communication protocol supports the generic vendor, and if the selected communication protocol does not support the generic vendor, removing, from the

device object, the information for accessing the network device using the selected communication protocol; and

if the obtained vendor is supported by the selected communication protocol, performing further tests related to model information.

3. The method of claim 2, wherein the step of performing further tests related to model information comprises:

determining whether a model of the network device can be obtained from the network device using the selected communication protocol;

if the preceding determining step determines that the model can not be obtained using the selected communication protocol, checking whether the selected communication protocol supports a generic model, and if the selected communication protocol does not support the generic model, removing, from the device object, the information for accessing the network device using the selected communication protocol;

if the preceding determining step determines that the model can be obtained using the selected communication protocol, obtaining the model from the network device and determining whether the obtained model is supported by the selected communication protocol; and

if the obtained model is not supported by the selected communication protocol, checking whether the selected communication protocol supports the generic model, and if the selected communication protocol does not support the generic model, removing, from the device object, the information for accessing the network device using the selected communication protocol.

4. The method of claim 1, wherein the obtaining step comprises:

obtaining, from the device object, a protocol parameter map comprising at least one entry, wherein each entry comprises a protocol string and a corresponding vector of information used to access the network device using a protocol indicated in the protocol string.

5. The method of claim 1, wherein the step of determining if the network device can be accessed comprises:

transmitting, to the network device, the information for accessing the network device using the selected communication protocol;

receiving, by the network device, the transmitted information; and

determining if the network device responds to the received information indicating that the network device can be accessed using the selected communication protocol.

6. The method of claim 1, further comprising:

repeating the selecting, obtaining, determining, removing, and performing steps for each protocol of the plurality of communication protocols.

7. The method of claim 1, wherein the selecting step comprises:

selecting the communication protocol among SNMP, HTTP, and FTP.

8. The method of claim 1, wherein the step of performing further tests comprises:

checking whether the selected communication protocol is SNMP,

wherein, if the checking step determines that the selected communication protocol is SNMP, the selected communication protocol can be used to extract the status information from the network device.

9. A system for determining which, if any, communication protocols can be used to extract status information related to a network device, comprising:

means for selecting a communication protocol among a plurality of communication protocols;

means for obtaining, from a device object associated with the network device, information for accessing the network device using the selected communication protocol;

means for determining if the network device can be accessed using the selected communication protocol and the information for accessing the network device obtained from the device object;

means for removing, from the device object, the information for accessing the network device using the selected communication protocol, when the means for determining determines that the network device can not be accessed using the selected communication protocol; and

means for performing further tests to determine whether the selected communication protocol can be used to extract the status information from the network device, when the means for determining determines that the network device can be accessed using the selected communication protocol.

10. The system of claim 9, wherein the means for performing further tests comprises:
means for determining whether a vendor of the network device can be obtained from the network device using the selected communication protocol;

means for checking whether the selected communication protocol supports a generic vendor, when the means for determining determines that the vendor can not be obtained using the selected communication protocol, and means for removing, from the device object, the information for accessing the network device using the selected communication protocol, when the selected communication protocol does not support the generic vendor;

means for obtaining the vendor from the network device and means for determining whether the obtained vendor is supported by the selected communication protocol, when the means for determining determines that the vendor can be obtained using the selected communication protocol;

means for checking whether the selected communication protocol supports the generic vendor, when the obtained vendor is not supported by the selected communication protocol, and means for removing, from the device object, the information for accessing the network device using the selected communication protocol, when the obtained vendor is not supported by the selected communication protocol; and

means for performing further tests related to model information, when the obtained vendor is supported by the selected communication protocol.

11. The system of claim 10, wherein the means for performing further tests related to model information comprises:

means for determining whether a model of the network device can be obtained from the network device using the selected communication protocol;

means for checking whether the selected communication protocol supports a generic model, when the means for determining determines that the model can not be obtained using the selected communication protocol, and means for removing, from the device object, the

information for accessing the network device using the selected communication protocol, when the selected communication protocol does not support the generic model;

means for obtaining the model from the network device and means for determining whether the obtained model is supported by the selected communication protocol, when the means for determining determines that the model can be obtained using the selected communication protocol; and

means for checking whether the selected communication protocol supports the generic model, when the obtained model is not supported by the selected communication protocol, and means for removing, from the device object, the information for accessing the network device using the selected communication protocol, when the obtained model is not supported by the selected communication protocol.

12. The system of claim 9, wherein the means for obtaining comprises:

means for obtaining, from the device object, a protocol parameter map comprising at least one entry, wherein each entry comprises a protocol string and a corresponding vector of information used to access the network device using a protocol indicated in the protocol string.

13. The system of claim 9, wherein the means for determining if the network device can be accessed comprises:

means for transmitting, to the network device, the information for accessing the network device using the selected communication protocol;

means for receiving, by the network device, the transmitted information; and

means for determining if the network device responds to the received information indicating that the network device can be accessed using the selected communication protocol.

14. The system of claim 9, wherein the means for selecting comprises:

means for selecting the communication protocol among SNMP, HTTP, and FTP.

15. The system of claim 9, wherein the means for performing further tests comprises:

means for checking whether the selected communication protocol is SNMP,

wherein, if the means for checking determines that the selected communication protocol is SNMP, the selected communication protocol can be used to extract the status information from the network device.

16. A computer program product having a computer readable medium for determining which, if any, communication protocols can be used to extract status information related to a network device, comprising:

- instructions for selecting a communication protocol among a plurality of communication protocols;

- instructions for obtaining, from a device object associated with the network device, information for accessing the network device using the selected communication protocol;

- instructions for determining if the network device can be accessed using the selected communication protocol and the information for accessing the network device obtained from the device object;

- instructions for removing, from the device object, the information for accessing the network device using the selected communication protocol, when the instructions for determining determine that the network device can not be accessed using the selected communication protocol; and

- instructions for performing further tests to determine whether the selected communication protocol can be used to extract the status information from the network device, when the instructions for determining determine that the network device can be accessed using the selected communication protocol.

17. The computer program product of claim 16, wherein the instructions for performing further tests comprise:

- instructions for determining whether a vendor of the network device can be obtained from the network device using the selected communication protocol;

- instructions for checking whether the selected communication protocol supports a generic vendor, when the instructions for determining determine that the vendor can not be obtained using the selected communication protocol, and instructions for removing, from the device object, the information for accessing the network device using the selected

communication protocol, when the selected communication protocol does not support the generic vendor;

instructions for obtaining the vendor from the network device and instructions for determining whether the obtained vendor is supported by the selected communication protocol, when the instructions for determining determine that the vendor can be obtained using the selected communication protocol;

instructions for checking whether the selected communication protocol supports the generic vendor, when the obtained vendor is not supported by the selected communication protocol, and instructions for removing, from the device object, the information for accessing the network device using the selected communication protocol, when the selected communication protocol does not support the generic vendor; and

instructions for performing further tests related to model information, when the obtained vendor is supported by the selected communication protocol.

18. The computer program product of claim 17, wherein the instructions for performing further tests related to model information comprise:

instructions for determining whether a model of the network device can be obtained from the network device using the selected communication protocol;

instructions for checking whether the selected communication protocol supports a generic model, when the instructions for determining step determine that the model can not be obtained using the selected communication protocol, and instructions for removing, from the device object, the information for accessing the network device using the selected communication protocol, when the selected communication protocol does not support the generic model;

instructions for obtaining the model from the network device and instructions for determining whether the obtained model is supported by the selected communication protocol, when the instructions for determining step determine that the model can be obtained using the selected communication protocol; and

instructions for checking whether the selected communication protocol supports the generic model, when the obtained model is not supported by the selected communication protocol, and instructions for removing, from the device object, the information for accessing

the network device using the selected communication protocol, when the selected communication protocol does not support the generic model.

19. The computer program product of claim 16, wherein the instructions for obtaining comprise:

instructions for obtaining, from the device object, a protocol parameter map comprising at least one entry, wherein each entry comprises a protocol string and a corresponding vector of information used to access the network device using a protocol indicated in the protocol string.

20. The computer program product of claim 16, wherein the instructions for determining if the network device can be accessed comprise:

instructions for transmitting, to the network device, the information for accessing the network device using the selected communication protocol;

instructions for receiving, by the network device, the transmitted information; and

instructions for determining if the network device responds to the received information indicating that the network device can be accessed using the selected communication protocol.

21. The computer program product of claim 16, further comprising:

instructions for repeating the instructions for selecting, instructions for obtaining, instructions for determining, instructions for removing, and instructions for performing for each protocol of the plurality of communication protocols.

22. The computer program product of claim 16, wherein the instructions for selecting comprise:

instructions for selecting the communication protocol among SNMP, HTTP, and FTP.

23. The computer program product of claim 16, wherein the instructions for performing further tests comprise:

instructions for checking whether the selected communication protocol is SNMP,

wherein if the instructions for checking determine that the selected communication protocol is SNMP, the selected communication protocol can be used to extract the status information from the network device.